

**ARRHOPALITES DIVERSUS MILLS, 1934 (COLLEMBOLA,  
ARRHOPALITIDAE): LECTOTYPE DESIGNATION AND  
REDESCRIPTION OF THE COTYPES**

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*Abstract.*—*Arrhopalites diversus* (Mills, 1934) lectotype is assigned from the original cotypes.

*Key words:* Collembola, Arrhopalitidae, *Arrhopalites*.

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Several authors have faced the problem of identifying of *Arrhopalites diversus* Mills, (1934) since its original description (Stach, 1945; Christiansen, 1966; Scott and Yosii, 1972; Christiansen and Bellinger, 1998). Confusion has been added as a result of misidentification by different authors (see Christiansen and Bellinger, 1998). I redefine and illustrate herein the original material designated as cotypes by Mills (1934), deposited in the Illinois State Natural History Survey, Urbana, Illinois. A lectotype is designated.

DESCRIPTION

*Arrhopalites diversus* (Mills, 1934)

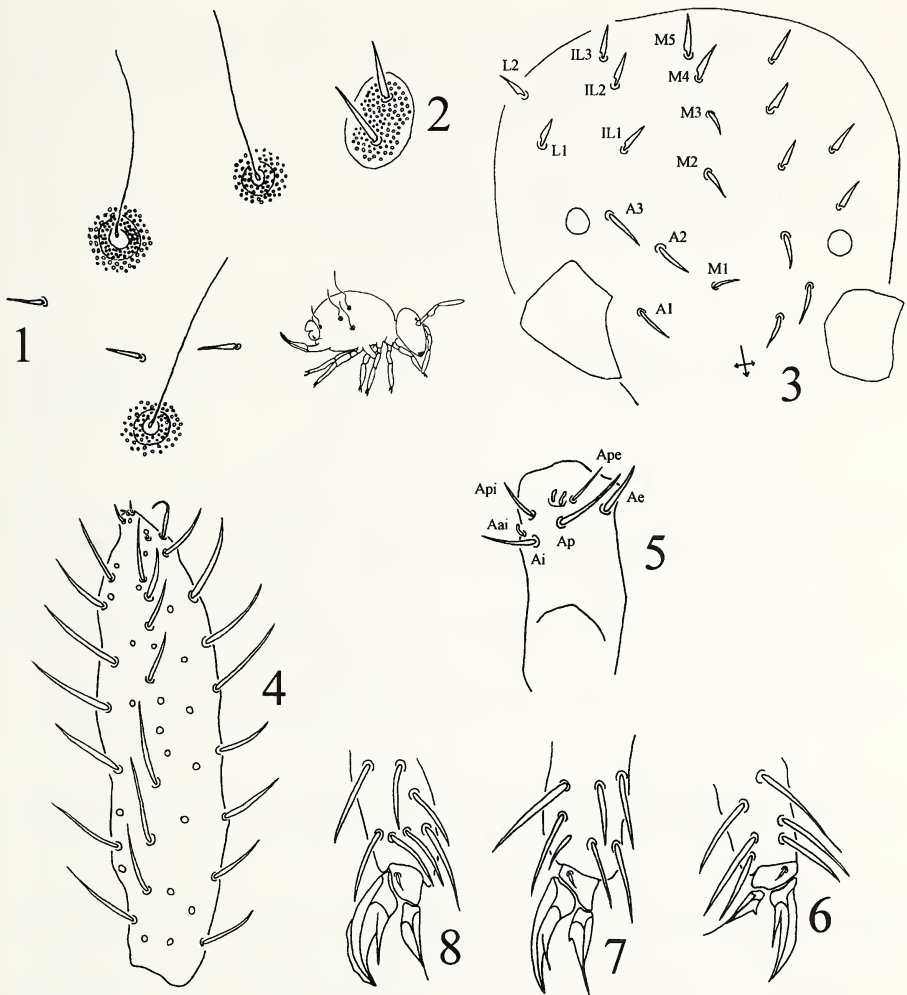
Figures 1–13

*Pseudarrhopalites diversus* Stach, 1945.

**Description.** Anterior part of body sparsely covered by short acuminate setae (Fig. 1), posterior abdominal setae in adult females 1.5 times longer than anterior ones and somewhat spinelike (Fig. 2). Eyes 1 + 1. Posterior cephalic setae  $A_1$ ,  $A_2$  and  $A_3$ , as well as  $M_1$ ,  $M_2$  and  $M_3$  not spinelike; L and IL series weakly spinelike (Fig. 3). Antennae about 1.3 times longer than cephalic diagonal. Fourth antennal segment not subdivided, longest setae less than 1.5 times diameter of segment, hook-like seta and club-shaped sensilla present at apex of segment (Fig. 4). Aai seta of apical organ of Ant. III short, blunt, and rod like;  $A_i$ ,  $A_p$  and  $A_e$  similar and acuminate;  $A_{pi}$  and  $A_{pe}$  shorter, slender, and acuminate; Ant. III swollen basally (Fig. 5).

Fore and hind unguis with a striking long filamentous inner tooth (Figs. 6–8), third unguis with a weak tunica. First unguiculus slender, with a distinct corner tooth and a short apical filament not exceeding unguis tip (Fig. 6). Second unguiculus with a little corner tooth and with very short apical filament (Fig. 7). Third unguiculus without corner tooth (Fig. 8). Metatrochanteral organ typical for the genus (Fig. 9). Tenaculum with one setula on the corpus, ramus with three teeth and a basal peglike appendage (Fig. 10).

Dens with 3:2:1:1 ventral setae; dorsal setae  $E_1$ ,  $E_2$  and  $E_3$  spinelike,  $E_4$  and  $E_5$  present.  $L_1$  somewhat spinelike,  $L_2$  present,  $L_3$  absent.  $D_1$ ,  $D_2$   $Id_3$  and  $Id_4$  present

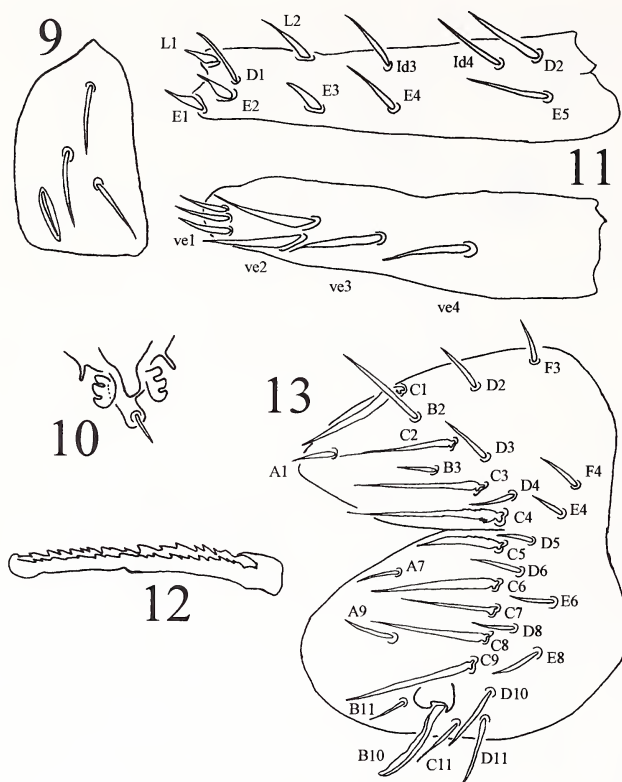


Figs. 1–8. *Arrhopalites diversus*, structural details. 1. Anterior body setae and trichobothrial pattern. 2. Posterior body setae. 3. Posterior cephalic chaetotaxy. 4. Fourth antennal segment. 5. Apical organ of third antennal segment. 6. First foot complex. 7. Second foot complex. 8. Third foot complex.

(Fig. 11). Mucro with both edges serrated, ventral lamella constricted medially (Fig. 12).

Sixth abdominal segment without spines on ventral and dorsal valves. Circumanal setae C slightly swollen basally. C<sub>7</sub> slender from the base to the tip, C<sub>11</sub> and D<sub>5</sub> present. Subanal appendage slender and flattened, leaf-like, with thinner edge slightly fringed (Fig. 13).

**Type.** Lectotype, ♀ (marked with an engraved ring on the underside of the slide), USA, Iowa, Leon, 31.x.1932, B. V. Travis leg., H. B. Mills det. (INHS).



Figs. 9–13. *Arrhopalites diversus*, structural details. 9. Metatrochanteral organ. 10. Tenaculum. 11. Dental chaetotaxy, dorsal and ventral view. 12. Mucro. 13. Anal valve chaetotaxy.

**Material examined.** USA, Iowa: 2 ♀♀, in the same slide with the lectotype (not marked with a ring); 1 ♂, Leon, 31.x.1932, B. V. Travis leg., H. B. Mills, det. (INHS); 1 ♂, Leon, 10.x.1933, B. V. Travis leg. H. B. Mills det., (INHS).

**Discussion.** *Arrhopalites diversus* can be easily recognized by its long filamentous inner teeth on the unguis and the slender, flattened subanal appendage. The undivided fourth antennal segment is not a good feature to identify the species, because several closely related undescribed species from Alaska, Canada, Spain and Mexico present this condition.

A more difficult problem of interpretation concerns seta  $D_5$ . This seta is often located between  $C_5$  and the upper-lower valve fold. It is present in the lectotype and paralectotype (Fig. 13), but it is absent in other related species studied in a complete revision of the “*A. diversus*-like” complex (in preparation).

The anal valve chaetotaxy used here follows the Lawrence’s (1978) system. However, establishing homology of the anal valve setae is always problematic (Christiansen and Bellinger, 1996), which is also true for the apical organ of the third antennal segment for which I followed Nayrolles (1991) and the cephalic and dental chaetotaxy (Christiansen and Bellinger, 1998).

This species seems to belong in the *A. caecus* group of the genus (Christiansen, 1966; Zeppelini, 1996), as shown by the presence of a medially constricted mucronal lamella and the spoon shaped mucronal apex. Christiansen (1966) points out: "It is a part of the *A. caecus* group . . . the presence of small spines on the anal valve, the presence of two  $ve_3$  setae, and the presence of a  $ve_5$  (seta on dens)". These features were not seen in the original type material or in the specimens of related species I studied. This indicates that a precise understanding of the phylogenetic position of the species must await the development of a detailed cladistic analysis of *Arrhopalites*.

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